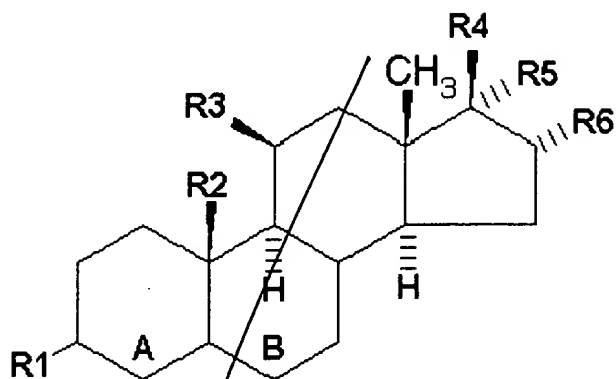


I



320
348
353

Wherein rings A, B have the same or different degrees of saturation,

wherein

R1 = OH or O,

R2 = H or CH₃,

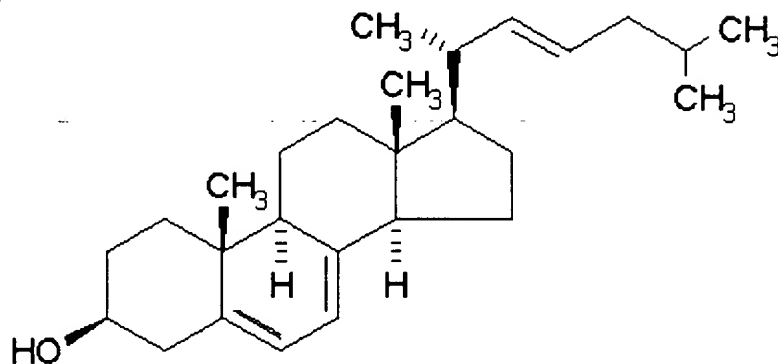
R3 = O, OH, or H,

R4 = O, OH, H, CO₂H, C(O)CH₂OH, or C(O)CH₃,

R5 = OH or H, and

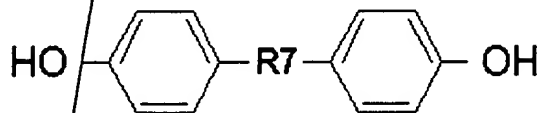
R6 = CH₃, OH or H;

II



- (2) a phenolic compound, wherein the phenolic compound is a phenolic estrogen or a diphenyl having structure III as below,

III

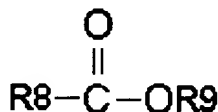


354

Wherein R7 = a direct connection (single bond) or a branched or unbranched alkene or alkane;

- (3) a long chain fatty acid having structure IV below,

IV

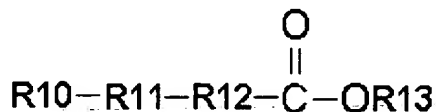


313

Wherein R8 is a saturated or unsaturated aliphatic chain comprising from 5 to 25 carbon atoms and R9 is a hydrogen or an aliphatic chain with 1-5 carbons;

- (4) a peroxisome proliferator having structure V below,

V



313

319

9

Wherein R10 is an aromatic ring or rings,

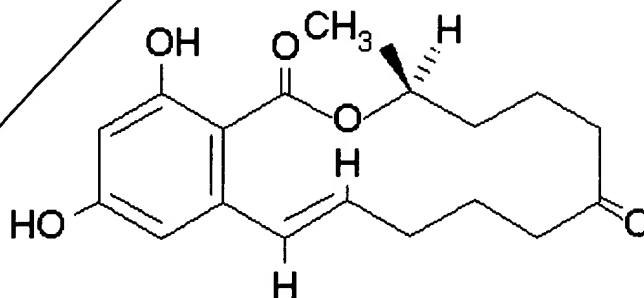
R11 is an O or S,

R12 is a branched or linear aliphatic chain comprising 1-8 carbons,

R13 is an aliphatic chain comprising from 1 to 5 carbon atoms; and

- (5) the fungal steroid zearalenone, having structure VI below,

VI

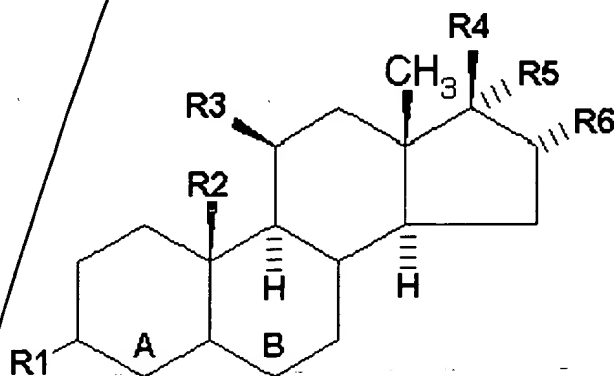


12. (Amended) A method of inducing disease resistance in a plant comprising applying to the surface of at least part of a plant capable of producing an isoflavone, a biologically effective amount of a composition comprising:

a) a nuclear receptor ligand selected from the group consisting of:

- (1) a steroid having structure I or structure II as below,

I



Wherein rings A, B have the same or different degrees of saturation,
wherein

R1 = OH or O;

R2 = H or CH₃,

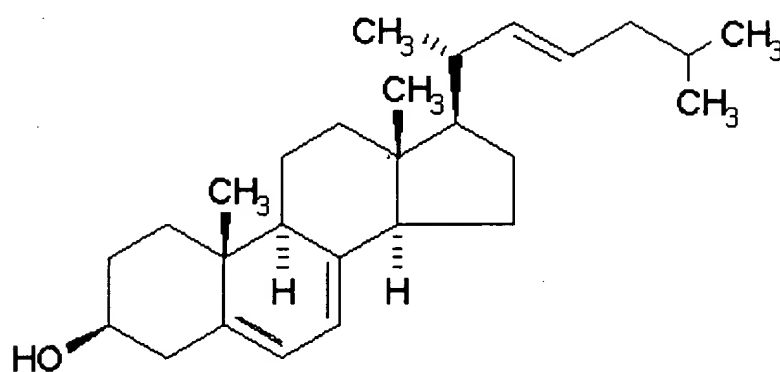
R3 = O, OH, or H,

R4 = O, OH, H, CO₂H, C(O)CH₂OH, or C(O)CH₃,

R5 = OH or H, and

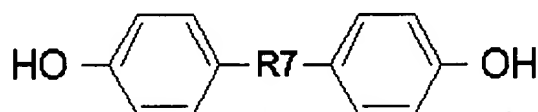
R6 = CH₃, OH or H;

II



(2) a phenolic compound, wherein the phenolic compound is a phenolic estrogen or a diphenyl having structure III as below,

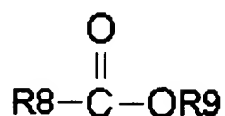
III



Wherein R7 = a direct connection (single bond) or a branched or unbranched alkene or alkane;

(3) a long chain fatty acid having structure IV below,

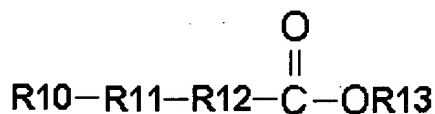
IV



Wherein R8 is a saturated or unsaturated aliphatic chain comprising from 5 to 25 carbon atoms and R9 is a hydrogen or an aliphatic chain with 1-5 carbons;

(4) a peroxisome proliferator having structure V below,

V



Wherein R10 is an aromatic ring or rings,

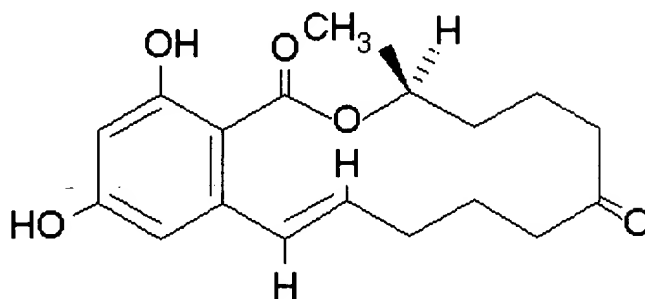
R11 is an O or S,

R12 is a branched or linear aliphatic chain comprising 1-8 carbons,

R13 is an aliphatic chain comprising from 1 to 5 carbon atoms; and

(5) the fungal steroid zearalenone, having structure VI below,

VI



291

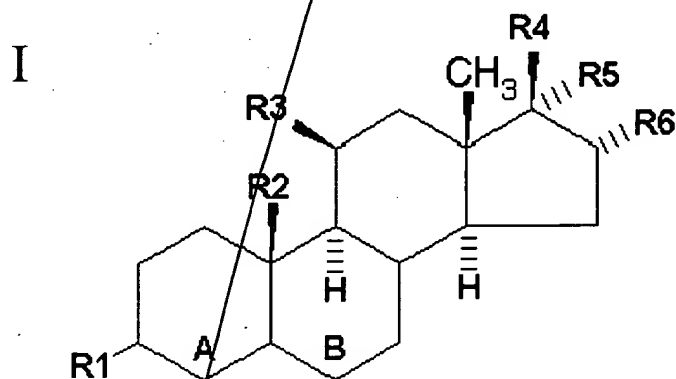
and

AK
LB2
H3
b) one or more compounds that enhance the release of isoflavones from a sugar conjugate, enhance the incorporation of aglycones into glyceollin, or enhance the release of isoflavones from a sugar conjugate and incorporation of aglycones into glyceollin.

21. (Amended) A composition for inducing disease resistance in a plant or seed, comprising:

(a) one or more nuclear receptor ligands, wherein said nuclear receptor ligands are selected from the group consisting of

(1) a steroid having structure I or structure II as below,



Wherein rings A, B have the same or different degrees of saturation,

wherein

R1 = OH or O,

R2 = H or CH₃,

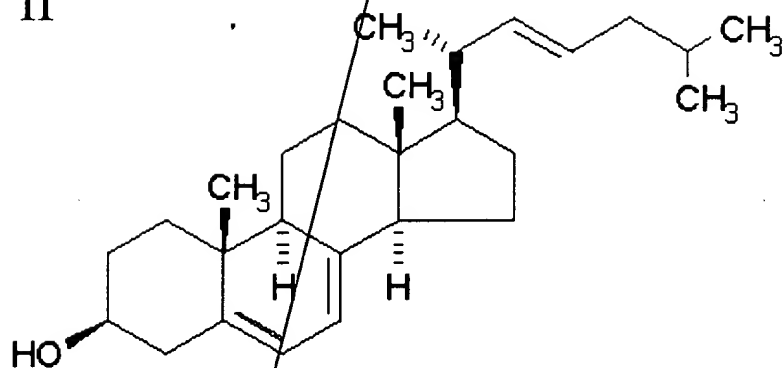
R3 = O, OH, or H,

R4 = O, OH, H or CO₂H, C(O)CH₂OH or C(O)CH₃

R5 = OH or H, and

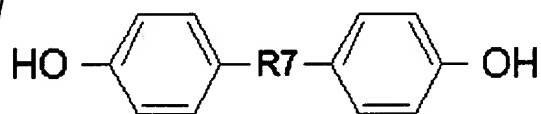
R6 = CH₃, OH or H.

II



(2) a phenolic compound, wherein the phenolic compound is a phenolic estrogen or a diphenyl having structure III as below,

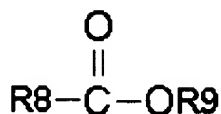
III



Wherein R7 = a direct connection (single bond) or a branched or unbranched alkene or alkane;

- (3) a long chain fatty acid having structure IV below,

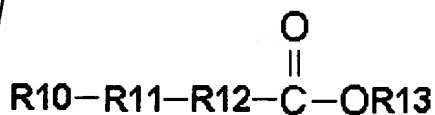
IV



Wherein R8 is a saturated or unsaturated aliphatic chain comprising from 5 to 25 carbon atoms and R9 is a hydrogen or an aliphatic chain with 1-5 carbons;

- (4) a peroxisome proliferator having structure V below,

V



Wherein R10 is an aromatic ring or rings,

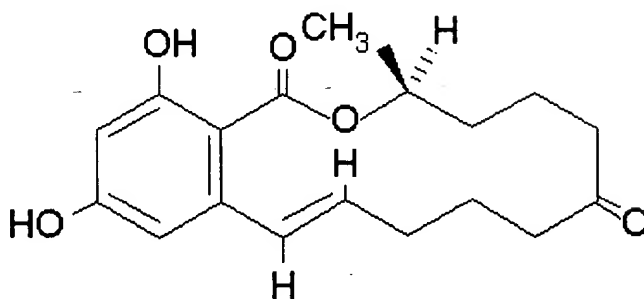
R11 is an O or S,

R12 is a branched or linear aliphatic chain comprising 1-8 carbons,

R13 is an aliphatic chain comprising from 1 to 5 carbon atoms; and

- (5) the fungal steroid zearalenone, having structure VI below,

VI



and

Sol B3
A3
cmf (b) one or more enhancing compounds which enhance the release of isoflavones from a sugar conjugate in the plant or seed, enhance incorporation of aglycones in the plant or seed into glyceollin, or enhance release of isoflavones from a sugar conjugate in the plant or seed and incorporation of aglycones in the plant or seed into glyceollin.

22. (Amended) The composition of claim 21 wherein the enhancing compound is orthovanadate, rose bengal, or a tetrazolium redox dye.

S
u
C 23. (Amended) The composition of claim 21 wherein the enhancing compound is a copper salt or a fragment of the naturally occurring cell wall glucan from the pathogen *Phytophthora sojae*.

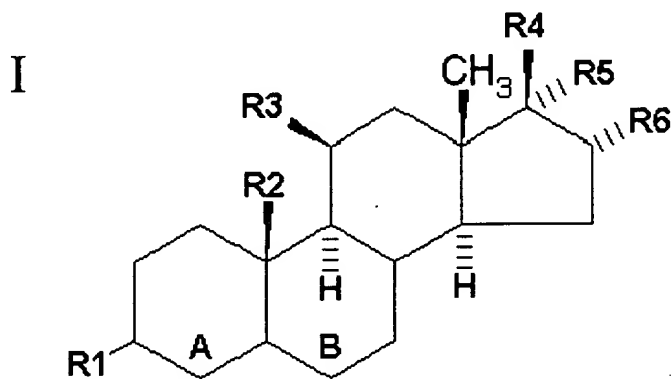
Please add the following claims:

A4 24. (New) The method of claim 12 wherein the enhancing compound is an ion effector or generates reactive oxygen intermediates.

25. (New) The method of claim 24 wherein the enhancing compound is orthovanadate.

26. (New) The method of claim 24 wherein the enhancing compound is rose bengal or a tetrazolium redox dye.

27. (New) A method of inducing production of isoflavones in a plant comprising applying to the surface of at least part of a plant capable of producing an isoflavone, a biologically effective amount of a composition comprising a steroid having structure I as below,



Wherein rings A, B have the same or different degrees of saturation,

wherein

R1 = OH or O,

R2 = H or CH₃,

R3 = O, OH, or H,

R4 = O, OH, H, CO₂H, C(O)CH₂OH, or C(O)CH₃,

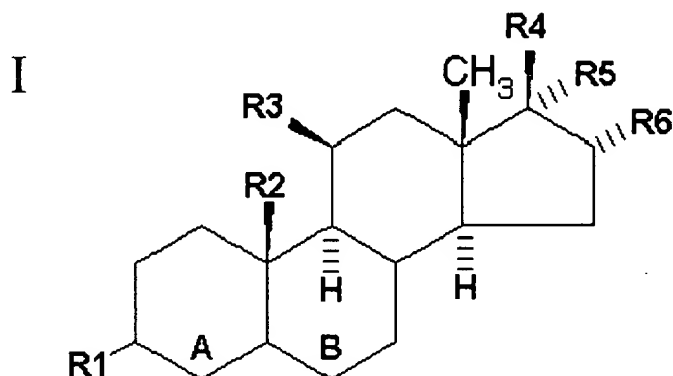
R5 = OH or H, and

R6 = CH₃, OH or H.

28. (New) The method of claim 27 wherein the steroid is selected from the group consisting of 17-beta-estradiol, estrone, estriol, ergosterol, zearalenone, aldosterone, androsterone, progesterone, pregnenolone, dexamethasone, cortisone, hydrocortisone, and combinations thereof.

29. (New) A method of inducing disease resistance in a plant comprising:

a) applying to the surface of at least part of a plant capable of producing an isoflavone, a biologically effective amount of a composition comprising a steroid having structure I as below,



Wherein rings A, B have the same or different degrees of saturation,

wherein

R1 = OH or O,

R2 = H or CH₃,

R3 = O, OH, or H,

R4 = O, OH, H, CO₂H, C(O)CH₂OH, or C(O)CH₃,

R5 = OH or H, and

R6 = CH₃, OH or H,

and

b) one or more compounds that enhance the release of isoflavones from a sugar conjugate, enhance the incorporation of aglycones into glyceollin, or enhance the release of isoflavones from a sugar conjugate and incorporation of aglycones into glyceollin.

30. (New) The method of claim 29 wherein the enhancing compound is an ion effector or an reactive oxygen intermediate generator.

31. (New) The method of claim 30 wherein the enhancing compound is orthovanadate.

32. (New) The method of claim 30 wherein the enhancing compound is rose bengal or a tetrazolium redox dye.

33. (New) The method of claim 29 wherein the enhancing compound is a copper salt or a fragment of a cell wall glucan from *Phytophthora sojae*.

34. (New) The method of claim 29 wherein the composition is applied to a legume selected from the group consisting of alfalfa, lima bean, pinto bean, chickpea, peanuts, and soybean.

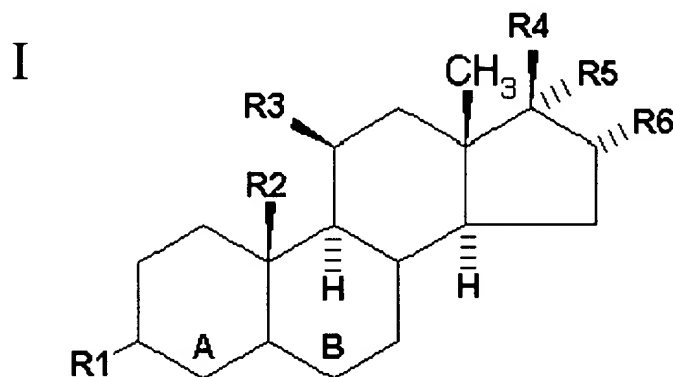
35. (New) The composition of claim 21 wherein the enhancing compound is an ion effector or reactive oxygen intermediate generator.

36. (New) The composition of claim 35 wherein the enhancing compound is orthovanadate.

37. (New) The composition of claim 35 wherein the enhancing compound is rose bengal or a tetrazolium redox dye.

38. (New) A composition for inducing disease resistance in a plant or seed, comprising:

a) one or more nuclear receptor ligands comprising a steroid having structure I as below,



Wherein rings A, B have the same or different degrees of saturation,

wherein

R1 = OH or O,

R2 = H or CH₃,

R3 = O, OH, or H,

R4 = O, OH, H or CO₂H, C(O)CH₂OH or C(O)CH₃

R5 = OH or H, and

R6 = CH₃, OH or H; and

(b) one or more compounds which enhance the release of isoflavones from a sugar conjugate, enhance incorporation of aglycones into glyceollin, or enhance release of isoflavones from a sugar conjugate and incorporation of aglycones into glyceollin.

39. (New) The composition of claim 38 wherein the enhancing compound is an ion effector or reactive oxygen intermediate generator.

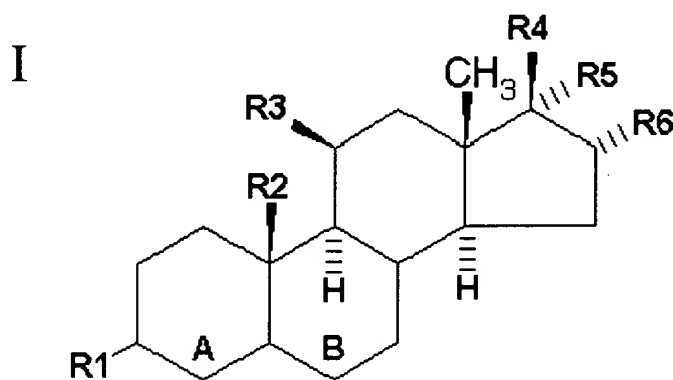
40. (New) The composition of claim 39 wherein the enhancing compound is orthovanadate.

41. (New) The composition of claim 39 wherein the enhancing compound is rose bengal or a tetrazolium redox dye.

42. (New) The composition of claim 38 wherein the enhancing compound is a copper salt or a fragment of a cell wall glucan from *Phytophthora sojae*.

43. (New) A composition for inducing disease resistance in a plant or seed, comprising:

a) one or more nuclear receptor ligands comprising a steroid having structure I as below,



Wherein rings A, B have the same or different degrees of saturation,

wherein

R1 = OH or O,

R2 = H or CH₃,

R3 = O, OH, or H,

R4 = O, OH, H or CO₂H, C(O)CH₂OH or C(O)CH₃

R5 = OH or H, and

R6 = CH₃, OH or H; and

(b) orthovanadate.